Division of Building Safety

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Service Entrance Cable (SE or SER)

It has been discovered that some contractors are using Service Entrance Cable (SE or SER) in residential branch circuits to feed large loads. NEC Article 338 is the article that governs the use of SE cables, 338.10 (4)(A) tells us that we use NEC Article 334 Parts I and II excluding 334.80. NEC article 334 parts I and II deals with the installation of the cables 334.80 deals with the temperature ratings of the wire, NEC 338.10 (4) FPN tells us to see NEC Article 310.10 for the temperature limitations. The conductors in SE Cable are spelled out by UL to be THWN, THWN-2, RHW, RHW-2, XHHW, or XHHW-2. When the marking on the cable does not appear it is to be considered 75º C, NEC 310.10 FPN tells us that we need to use tables 310.13 through 310.61. It is apparent that some have used NEC Table 310.15(B)(6) for the rating these cables. The example that I will use is #2 Aluminum SER cable if NEC Table 310.15(B)(6) is used it would allow you to use 100 Amp as a service entrance cable or a feeder to a lighting and appliance circuit panelboard. If the same cable is used to be a branch circuit to an electric furnace you will need to use NEC 310.16 for the same conductors and the rating is 90 amp. In the case of the branch circuit the maximum continuous load would be 80% of 90 amp or 72 amp.

The installation below demonstrates insulation will affect the ability of conductors to dissipate heat.